



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2003WA40B

Title: Non-point Pesticide Transport from Fields to Streams: Testing the Predictive Capability of a Geochemical Tracer Approach

Project Type: Research

Focus Categories: Non Point Pollution, Water Quality, Hydrogeochemistry

Keywords: Non point pollutants, lindane, triallate, pesticides, water quality, tracer

Start Date: 03/01/2003

End Date: 02/28/2004

Federal Funds Requested: \$25000.00

Matching Funds: \$50971.00

Congressional District: Fifth

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Abstract: Lindane, an agricultural insecticide that poses chronic risks to both human health and the environment, is consistently found in surface waters within Washington State. Over the past two years, our group has developed a geochemical tracer approach to predict agrochemical concentrations in surface waters that requires modest additional data collection associated with existing gauging. Using the geochemical tracer modeling approach, we can allocate pesticide discharges among and between fields, and according to land use practice and drainage regime. This year, the emergence of two new synthetic pesticides has caused a >80% decline in lindane use in our watershed. Our goal is to use this basin-wide "experiment" to test the geochemical tracer modeling approach as a means to quantify and predict the consequences of changing management practices on total pesticide stream discharge over multiple scales of study. The specific objectives of the study are to:

1. Determine the time-constant (decay constant) that describes declining export concentration associated with the cessation of lindane application at a field-to-basin scale;
2. Test and refine the predictive capability of the geochemical model by comparing forecasted behavior to observation;
3. Confirm a basin-wide decline in lindane mass discharge in response to diminished application by

comparing the lindane concentrations to those of another pesticide with similar chemical attributes (and with unchanged application) over the water year.

The completion of these objectives will lead to better understanding of the processes that control agrochemical transport and improved means to plan management strategies protective of water quality. Additionally, the improved understanding of processes gained will be applicable to other pesticides that have chemical properties similar to lindane.

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